OPTIONAL FORM NO. 10
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GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

~~SECRET~~

~~CONFIDENTIAL~~

NUMEC

TO : DIRECTOR, FBI (117-2564) DATE: 9/11/68

FROM : SAC, WFO [redacted] (P) b7c/4

SUBJECT: [redacted] (S) b7c/3
ATOMIC ENERGY ACT

APPROPRIATE AGENCIES AND FIELD OFFICES ADVISED BY ROUTING SLIP (S) OF [illegible] DATE 7/9/85 [illegible]

(b)(1)(4)(b)

Classified by 5669 SLD/KG
Declassify on: OADR 4-25-85

Unclassified Per DOE letter 4-16-85

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE

ReWFOlet 8/5/68.

On 9/6/68, [redacted] Security Office, AEC, Germantown, Md., advised that the AEC Security Office in NYC had contacted him that date to advise of the requested visit on 9/10/68, to NUMEC, Apollo, Pa., by the following: (U) b7c/2

AVRAHAM HERMONI, Scientific Counselor, Israeli Embassy, Washington, D. C.;

Dr. EPHRAIM BEIGON, Dept. of Electronics, Israel, born 7/15/32, in London;

ABRAHAM BENDOR, Dept. of Electronics, Israel, born 7/7/28, in Israel;

RAPHAEL EITAN, Chemist, Ministry of Defense, Israel, born 11/23/26, in Israel (U)

[redacted] (C)

(b)(1)(4)(b)

Class. & Ext. By [illegible]
Reason - FCIM II, [illegible]
Date of Review 5/21/82

2 - Bureau
2 - Pittsburgh [redacted] (RM) b7c/4
1 - WFO

REC 5 117-2564-72

2 SEP 13 1968

[redacted] b7c/1
(5)

NAT. INT. SEC.

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56 OCT 1 1968

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Document 131

NUMEC

CONFIDENTIAL

Nuclear Materials and Equipment Corporation Apollo, Pennsylvania Telephone Cable NUMEC

September 12, 1968

Mr. Harry R. Walsh, Director
Security & Property Management Division
United States Atomic Energy Commission
New York Operations Office
376 Hudson Street
New York, New York 10014

Classified by 56453 LD/KD 6-17-85
Declassify on: OADR

Dear Mr. Walsh:

Your permission is hereby requested for the visit of a non-citizen of (b)(1)(4)(d) the United States to Nuclear Materials & Equipment Corporation's facilities. The information relative to this visit is as follows: [redacted] (C)

a. Full name of the visitor: 1. Dr. Abraham Hermoni [redacted]

2. Mr. Ephram Beigon

b. Date and place of birth: 1. May 10, 1926; Tel-Aviv, Israel b7C/14

2. July 15, 1932; London, England

c. Citizenship: Israeli

d. Visitor's affiliation and position (company or government organization name):

1. Israeli Embassy - Scientific Councilor

2. Israeli Ministry of Defense - Group Leader, Dept. of Electronics

e. Proposed dates of visit: September 10, 1968

f. Purpose of visit: Discuss thermoelectric devices (unclassified)

g. Areas to be visited: Energy Conversion Laboratory

117-2564-84

RECORDED 81 OCT 2 1968

REC 11

117-256 [redacted]

CONFIRMING b7C/1

5- [redacted]

59 OCT 11 1968

CONFIDENTIAL

Mr. Harry R. Walsh

CONFIDENTIAL

September 12, 1968

h. Names of NUMEC personnel to be contacted: Z. M. Shapiro

i. NUMEC official recommending visit approval: Z. M. Shapiro
Zalman Mordecai

Please advise me of your approval action. Thank you very much for your cooperation.

Yours very truly,

Bruce D. Rice
Manager, Security

ch

CONFIDENTIAL

117-2524-81

NUMEC

Nuclear Materials and Equipment Corporation Apollo, Pennsylvania 15613 Telephone 412-842-0111 Cable NUMEC

NUMEC

September 27, 1968 Rec'd 10/3/68 b7C/2 from AEC [redacted] b7C/1 R. [redacted] b7C/1

Mr. Harry R. Walsh, Director
Security & Property Management Division
New York Operations Office
U. S. Atomic Energy Commission
376 Hudson Street
New York, New York 10014

[redacted] b7C/3

Dear Mr. Walsh:

Reference your telephone call concerning the September 10 visit of Messrs. Hermoni, Bendor, Eitan and Biegun, Israeli citizens. Please be advised of the following.

The above mentioned gentlemen met with Dr. Shapiro, D. Purdy, T. Hursen, J. Williams, and S. Kolenik. With the exception of Dr. Shapiro, all of the NUMEC personnel are in our Energy Conversion Department and are thermo-electric generator specialists.

Discussion with the Israeli nationals concerned the possibility of developing plutonium fueled thermo-electric generator systems in the 5 and 50 milliwatt power level. Specifically, they were interested in 10 generators in the 5 milliwatt range. Each of which would be fueled with about 2 grams of plutonium. The 50 milliwatt generator is considered a remote possibility, but would use approximately 20 grams of plutonium. The generators are of the terrestrial type.

We are proceeding to make a proposal to these gentlemen for this work using, of course, only unclassified information which is already in the public domain. It is also our understanding that these same gentlemen have visited several of the major nuclear organizations in the United States to develop proposals from them on these items.

I trust this satisfies your needs.

[redacted] b7C/1

Very truly yours,

Bruce D. [signature]
Manager, Security

NYOO SECURITY DIVISION

Furnished to Pittsburgh + New York 8/9 (?) by 0-7. 10-8-68

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 6-17-85 BY 5668 SLD/KJ
per DOE letter 6-6-85

EX 109

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117-2564 REC-1

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File - 5 [redacted] b7C/1

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DOCUMENT 149

NUMEC

Nuclear Materials and Equipment Corporation Apollo, Pennsylvania 15613 Telephone 412-842-3111 Cable NUMEC

October 8, 1968

Dr. Glenn T. Seaborg, Chairman
United States Atomic Energy Commission
Washington, D.C. 20545

Dear Dr. Seaborg:

NUMEC has been receiving a number of requests from potential domestic and foreign customers to furnish them with microwatt and milliwatt thermo-electric generators powered by Pu-238. The number of these inquiries has increased since the official A.E.C. announcement indicating the availability of Pu-238 for commercial applications.

However, despite this announcement, we have found it impossible to make any firm proposals for the supply of these units because we have not been able to get definitive answers to questions put to the A.E.C. regarding availability of the material in metallic form, purity, encapsulation cost, schedule and possible restrictions on use for domestic and foreign applications. More specifically, we must know:

1. Whether the material will be equally available for foreign applications as well as domestic applications. If this is not the case, what the specific restrictions are on foreign sales.

2. Whether there are any restrictions on the amount of Pu-238 in any particular device, assuming it can be licensed.

3. Whether any special criteria are to be employed in the design of the capsule and the device in which the capsule is located from the standpoint of licensing for domestic or foreign use.

4. What the minimum purity of the oxide will be.

5. Whether the material will be made available as metal as well as oxide since the oxide is unfit for many applications. Also, what will the minimum purity specifications and price on the metal be if it is supplied.

6. What maximum tolerance can be expected on the specified thermal and radiation output.

117 2564-136

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

NOV 20 1968

Dr. Zalman M. Shapiro, President
Nuclear Materials and Equipment
Corporation
Apollo, Pennsylvania 15613

Dear Zal:

This is in response to your letter of October 8, 1968, containing various questions pertaining to plutonium 238 for commercial applications. I am heartened by the increasing interest in the use of plutonium 238 as mentioned in your letter, and I want to be of assistance in any way I can in the encouragement of the beneficial use of this isotope and other Commission products. In the interest of clarity and to be sure I have responded to all your questions, I am answering the letter in the same format as you sent it to me.

In answer to your first question, the 500 grams of plutonium 238 made available in April 1968 may be used for foreign applications as well as domestic applications. Overseas distribution within the free world is made on a non-discriminatory basis by (1) direct purchase through the U.S. Atomic Energy Commission by means of a formal request from the overseas customer to the Division of International Affairs, U.S. Atomic Energy Commission, Washington, D.C., or (2) by direct purchase from any private source, subject to applicable rules and regulations of the Atomic Energy Commission for the export of special nuclear materials.

With regard to your second question, and in the context of your request, i.e., plutonium 238 for microwatt and milliwatt thermoelectric generators, there are no restrictions on the amount of plutonium 238 in a single device, assuming it can be licensed. Criticality is the only concern in terms of the amount of plutonium 238 that can be used in any particular device.

The answer to your third question is that from the standpoint of licensing for domestic or foreign use, there are no special criteria to be employed in the design of the capsule and the device in which the capsule is located.

117-256 F-155
ENCLOSURE

DOCUMENT 246

Concerning your questions 4., part of 5., and 6., we have enclosed a very recent compilation of plutonium 238 data which has been accumulated by the Mound Laboratory over a number of years. While there is no material specification, as such, for the commercially available plutonium oxide, these data should be helpful in answering your questions concerning the characteristics of the isotope in oxide, metal and other forms on the basis of average values. The heat source specification which was developed for the cardiac pacemaker and in which you are currently participating, may be considered typical of the metal which the AEC could supply.

With regard to the remainder of question 5., and questions 7., 8., and 9., conversion from the oxide to other forms, such as the metal, and encapsulation services are available through AEC laboratories at additional cost but only if they are not available from private industry. Members of our staff have had discussions with the following companies which have indicated some capabilities in these areas: Atomics International, Donald W. Douglas Laboratory, General Nuclear Incorporated, Monsanto Research Corporation, and the Vallecitos Atomic Laboratory of the General Electric Company. As stated by Dr. Herman M. Roth, Director, Laboratory University Division, Oak Ridge Operations Office, in his letter dated October 29, 1968, to Mr. C. H. Whitmire of your company, if these or other commercial sources are not responsive to your needs, the work you wish to have done can be requested through the Isotopes Sales Department of the Oak Ridge National Laboratory. The criteria for the AEC performing this work are essentially those which Dr. Roth enumerated. Namely, your request should be accompanied by a list of the commercial firms you have contacted, their reasons and yours for not providing the services, and any other information which would be useful in evaluating your request. The description of the work you wish to have done should include the quantity of isotope fuel, the fuel form, thermal wattage per source, capsule design, encapsulating materials, and total number of heat sources to be fabricated. Only after this information has been received can the costs of your work, which would be based on full cost recovery, be established. At that time, delivery schedules could be established on a non-interfering basis and a determination made as to whether NUMEC or the AEC laboratory would supply capsule parts.

I hope this information has been helpful to you and that I have answered all your questions concerning the use of plutonium-238 in milliwatt and microwatt thermoelectric generators. I would be happy

to have you discuss these matters further with Commission personnel if you so desire. In this regard I suggest that you call Milton Klein and John McBride for programmatic and licensing discussions, respectively, and they will be glad to arrange to meet with you.

Cordially,

(Signed) Glenn T. Seaborg

Chairman

Enclosure:
Plutonium 238 Data Sheets